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THE AMERICAN X-RAY JOURNAL

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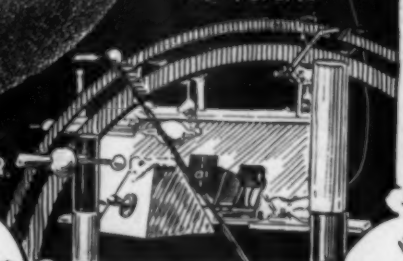

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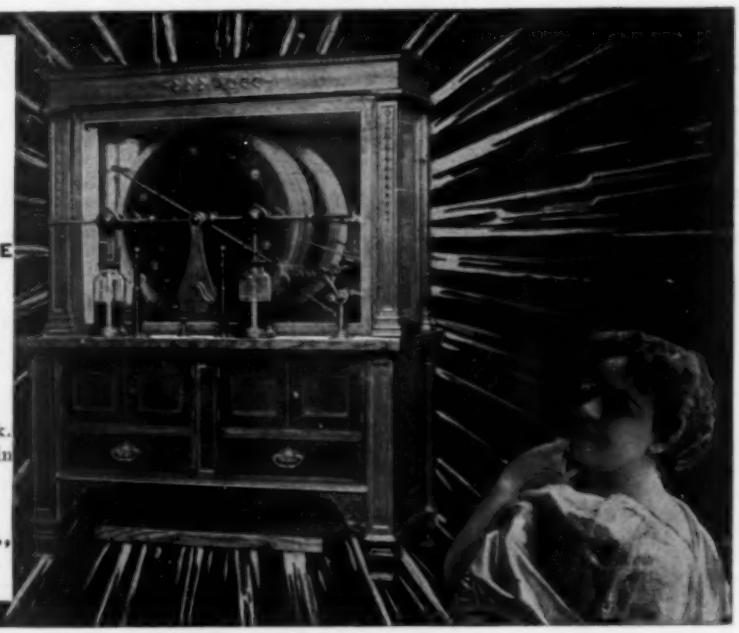

THE AMERICAN

X-RAY JOURNAL.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

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HEBER ROBARTS. M. D., M. E., Editor.

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DR. J. RUDIS-JICINSKY.

The American X-Ray Journal.

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VOL. 7. *ST. LOUIS, AUGUST, 1900.* *NO. 2.*

ROENTGEN SOCIETY OF THE UNITED STATES.

The Roentgen Society of the United States will meet in New York City, December 13th and 14th, 1900, at the Academy of Medicine. Papers have been promised by eminent men abroad and at home, and a very successful scientific meeting is assured.

The officers of our society are desirous of building up an organization which will have for its object the advancement of pure x-ray science and art. It is expected that we will be in position to glean from all sections of the world, useful facts for the purpose of publication and teaching. The burden of spreading the knowledge of the technique of electrology and radiology amongst our members is devolved upon us, and with the promotion of harmony and fraternity in the professions using the x-rays, our sphere of knowledge will be widened.

We kindly and earnestly ask that every x-ray worker will give a little of his valuable time and influence in accomplishing the object in view, that it may be the means of enlisting many who heretofore have not taken any interest in this line of work, in the new means of early and proper diagnosis and the therapeutic value of the x-ray. Let us strive to interest physicians, surgeons and dentists, in the use of the x-rays, and as medical men, to help to promote all measures adapted to the relief of suffering, and to improve the health and protect the lives of the community. We have to try, therefore, to bring the x-rays more and more to the attention of the profession. We feel that very much can be done, and at our New York meeting it will be proven that every physician, surgeon, dentist, etc., ought to learn to make x-ray examinations himself. There will be offered advantages to the visiting members at this meeting, for instruction in x-ray work that cannot be had under any other conditions.

It is especially desired that all hospitals using x-ray apparatus, x-ray studios and laboratories, physicians, surgeons and dentists doing x-ray work, scientific investigators, manufacturers and dealers in x ray apparatus of all kinds throughout the United States, should at once send their names and addresses to the Chairman of Committee of Arrangements, Dr. S. H. Monell, 43 East 42nd street, New York city, so that they may receive important notices regarding our meeting.

All those wishing to become members, or read a paper before the society, may communicate with the secretary. *No quacks or fakes of whatever sort need apply.* The Committee of Arrangements will verify the credentials of delegates and members, receive and examine all applications and letters of introduction presented by those wishing to become members by invitation; recommend the number and length of sessions, demonstrations, experimenta-

tions, etc., to be held daily, receive and announce all voluntary communications, and take general supervision of all the preliminary work and of the arrangement of business coming before the meeting, reporting time to time as it may be necessary.

To make our regular gathering pleasant and profitable, the president, Heber Robarts, St. Louis, Mo., appointed the following committees, whose duty it shall be to communicate with the Chairman of the Committee of Arrangements and report to the society at our meeting in New York.

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Signed .....

Full name.

P. O. Address.....

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DR. J. RUDIS-JICINSKY.

CEDAR RAPIDS IOWA.

"The Photogram" is a regular visitor. It reaches us monthly and is the most picturesque and artistic publication that we receive. It is replete with illustrations, every one of which hinges upon a story pertaining to photographic art and science. We have seen in this journal some of the richest colored photography yet made. Sometimes something good is said about the x-rays, but we have looked, with disappointment, for more on the development of the x-ray plates. The JOURNAL should go into the hands of every person interested in art, and especially that phase which embraces kodak and photographic work. "The Photogram" for July is a special landscape issue.

The Editor of the AMERICAN X-RAY JOURNAL will gladly answer any inquiry upon X-ray matter. Postage should accompany such inquiry.

EXCITATION OF THE CROOKE'S TUBE BY THE STATIC MACHINE.

Disruptive Discharges.

By John T. Pitkin, M. D.

Chapter VII.

During atmospheric disturbances two clouds, or a cloud and the earth frequently become charged with opposite varieties of electricity, the intervening atmosphere is strained by a magnetic field of force until its limit of strength is reached; the dielectric breaks at the weakest point, a crash and a lightning flash are the manifestations of the unloading of one of Jehovah's Leyden jars, the disruptive discharge of the static machine of the Omnipotent.

SUBLUXATION OF ELBOW JOINT, SKIOGRAPH TAKEN WITH TEN, THIRTY INCH, REVOLVING PLATES, TWO SPARK GAPS IN THE CIRCUIT.

In a similar manner, when a Leyden jar of a Holtz generator is excessively charged, the dielectric glass, which is the seat of the magnetic field, is strained; under the extreme molecular tension the structure gives way, the glass is ruptured and the condenser ruined. The thicker the glass the less danger of breaking, but the magnetic permeability is proportionately lessened. As annealed glass possesses superior dielectric strength and is less liable to breakage from various causes, the Leyden jars, stationary and revolving plates, should be made of that material. When a Crooke's tube is operated in simple series, the dielectric air within the static generator, is strained in direct proportion to the voltage used. Should the atmosphere suddenly give way, a spark will leap across between the comb-holders of opposite sides, and the tube will be severely strained or punctured. The liability to internal disruptive discharges is greater when the current is made interruptive by spark gaps, than when it is continuous, becaue the dielectric can better bear a steady than an intermittent strain.

In a darkened apartment the modern static apparatus affords certain luminous characteristics from which the skilled operator obtains the following valuable information: (1.) The polarity, i. e., which side is positive and which negative. (2.) The volume of current being supplied to the tube. (3.) Whether there are inactive or unexcited portions. (4.) The presence

or absence of extrinsic or wasteful internal discharges. (5.) The maximum voltage or difference of potential at which the machine can be operated.

From the teeth of the combs of the negative side of the generator may be seen a characteristic purple brush discharge, from three to five inches long, which seems to be leaping upwards to meet the approaching portions of the revolving disks, it appears as if each tooth gave vent to a burning jet of gas, blazing against their surface. On the positive side the illumination is extremely meagre, each tooth being tipped with a miniature glow, as if mounted with a little sparkling gem.

The total amount of negative brush discharge may be used to estimate the quantity of electricity being generated. Unexcited or inactive sections of the apparatus can be detected by the absence of the usual brush or glow discharges upon the corresponding collecting combs.

To determine the potential limitations, the degree of insulation and the presence or absence of internal wasteful discharges, the operator runs the machine at usual speed, starting with about one inch air space between the discharging rods of the prime conductors, gradually increasing the distance, he observes the luminous manifestations. If, with from four to five inches of air gap, internal sparking occurs between the comb-holders and the stationary plates, or their supporters of the same side, either the parts are too closely set to each other, or the insulation is defective. As the discharging rods are slowly opened a gap will eventually be formed from which the current will begin to fall off; it may flicker, become irregular, or even entirely disappear. Simultaneously with the current's failure, there are visible internal perturbations. Whereas, with a shorter spark gap there were only harmonious, symmetrical, intrinsic manifestations previously described, now irregular or extrinsic discharges become apparent. Leaping between one or more pairs of comb-holders of the opposite side of the machine, may be seen as many purple brush discharges or indistinct aurorial bands; they may be continuous or intermittent, stationary, or shifting from one pair of rods to another. The external convective discharge is proportionately lessened because the machine is more or less completely short circuited. Crook's tubes obtained from the dealers are usually soft, i. e., their resistance is low, corresponding to from three to five inches of air space; with continued use they gradually become hard, their resistance increases until an E. M. F. capable to overcome an eight or ten-inch spark-gap may be required for their excitation. Obviously a machine with short circuits under this pressure becomes inadequate.

The remedies for internal sparking are the following:

(1.) Shorter comb-holders, this amounts to increasing the air space or thickening the dielectric.

(2.) Improvement in insulation and the quality of the dielectric. Drying the air with quick-lime (calcium oxide) or calcium chloride, very materially increases its dielectric strength. Several pounds of the lumps of unslacked lime in a closed wooden box, the top of which has been honeycombed with gimlet holes, should be placed within the case and the same replenished at stated intervals.

When not confined the fine powder of slacked lime resulting from the chemical union of water and the oxide, becomes disseminated and renders the appartus unsightly.

Sparking between the neutralizing rod and other conductors can be arrested by moving that structure to a more remote position, shielding it with a sheet of glass or hard rubber or placing the same on the exterior of the case. Because all disruptive discharges have their origin from the positive side of the generator that portion requires the strongest insulation. The study of the passage of high tension currents from induction coils, through Geiss-

ler tubes teaches us that they are always disruptive, that the positive discharge is excentric and cork-screw shaped, like the rings of smoke emitted from a railway locomotive, whereas the negative discharge is through the center of the tube, rectilinear in propagation.

As hard rubber is over ten times stronger than air, as a dielectric, large washers made of that material may be interposed between the revolving plates, they should be from twelve to fourteen inches in diameter, nearly filling the space between the axle and comb supporters, only allowing sufficient room to clear the holders when the apparatus is in operation. The electric current from a static machine made intermittent by spark gaps is disruptive in character, it will strain the tube in direct proportion to the length of the air spaces, the interval between the pulsations and the voltage used. Without sparking intervals the discharge is steady, uniform, continuous, undirectional, high tension, not disruptive and nonoscillatory, hence the strain upon the Crooke's tube is at a minimum. The static machine is the only devise ever invented capable of generating this variety of current.

BUFFALO, N. Y.

Alfred E. Dean, of 73 Hatton Garden, London, has issued a catalogue entitled Radiography. The subject matter does not indicate its title, since the contents are almost entirely devoted to D'Arsonvalisation, or the medical employment of currents of great frequency and high potential. The folder has sixteen pages and is beautifully illustrated, showing apparatus, electrolytic interrupter and patient under treatment. There is a short review therein on Auto-Condensation and Auto-Conduction.

Physicians who desire to be posted in what is being done in x-ray work should read the American X-Ray Journal. Subscribe now.

X-RAY BURNS.

BY J. N. SCOTT, M. D.

LECTURER ON ELECTRO-THERAPEUTICS, UNIVERSITY MEDICAL COLLEGE.

I should like to see the subject of x-ray burns taken up and discussed further. In three years work I have had no so-called "burns" until recently.

In the beginning of the work I escaped many of them because I placed the tube some distance from the patient in order to get good definition, and for the last two years I have always placed a rubber sheet over the patient as a precaution, and always place the tube eight inches from the patient for exposures up to ten minutes, and if I make several exposures aggregating more than ten minutes, I place the tube ten inches away.

About two months ago I made a ten-minute exposure of a patient's neck; she was very nervous and inclined to be hysterical—age 23. About one year ago she had been in a railroad wreck and nervous symptoms dated from then.

Before having the picture taken, she had been told the ray would burn her, and she firmly believed it, although her physician and I told her there was very little danger.

About three hours after the exposure, the side of the face next the tube became red and swollen, and she complained of considerable pain. The swelling and pain subsided in five days, and one week after the first exposure I made a second, and she fainted at the end of five minutes. She was accustomed to faint after any excitement.

Six hours after this exposure her face began to swell again, this time the swelling lasted two weeks, and the skin came off; but there was no ulceration, and she is now doing nicely. This case is peculiar in that the effects were manifest so soon after the exposure.

In another case, I made two exposures of the hip of a young lady 16 years old, but very large for her age. Each exposure ten

minutes; each tube ten inches from body. I also used the rubber sheet. Second exposure was one week after the first.

About one week after the second exposure, the patient noticed the hands were inflamed and tender. During the exposure the hands were folded across the abdomen. Four days after this, the abdomen became inflamed and very tender, accompanyed with considerable pain.

The skin came off, a few points ulcerated; inflamation lasted six weeks. In making the exposure the anode was directly over the hip joint, and the axis of the tube was parallel with body, the anode end of tube was toward the face. This case is peculiar because the back of hand, which we would think would be last to be affected, was first to be involved. That the hip under anode was not affected, but that the abdomen which was much further from the tube, was burned.

Until I had these cases, I would have said, like many others, "that there was no necessity of burning a patient, and that when it did occur, it was carelessness in holding the tube close to patient, and making a long exposure, or a number of short exposures close together." But I have changed my opinion.

I would like to have the following questions answered and discussed.

Do some patients have an idiosyncrasy for the ray? What is the best method to prevent burns? Is there any class of individuals more susceptable to the socalled "burns" than others?

What is the socalled burn due to?

Is it due to an effect on the trophic nerves, or to a chemical action set up by the currrent?

KANSAS CITY, MO.

The serial articles on static currents, written by Dr. Jno. T. Pitkin, M. D., of Buffalo, N. Y., and printed in the AMERICAN X-RAY JOURNAL, are most timely, and should be studied by every one interested in electricity and the x-rays.

PRO ET CONTRA.

BY J. RUDIS-JICINSKY, A. M. M. D.

We all know how quickly the hope sprang up that the x-ray might be the best means in diagnosis of the presence of foreign substances in the body, in bone-surgery, diseases of the chest, etc., and how many disappointments followed its application on these lines. Very early in the history of the x-ray, it was found that we have to deal only with a shadow, with all the limitations which the term implies. By repeating experiments, research, facts, experiences and better technique, we are now able to do work that is much more successful. In speaking of this branch of surgery and medical science, I believe that those who use the x-ray in their practice, will agree with me that they have derived little or no benefit from books on this subject, but have been compelled, like myself, to study and learn the art of practical radiography in the hard school of experience.

If we all remember that we are dealing with a shadow, which may be easily exaggerated or changed by position, a shadow not only treacherous, but lacking in the dimension of thickness, we will not and cannot accept radiographs made without the proper proof that the subject was placed in a certain and definite position, which is marked on the picture by a fluorometer, giving accurate cross-section. This is a convenient appliance that can accurately locate a foreign body, determine dislocations and give correct shadow of fractures. This method of the photography of the invisible is absolutely reliable, and indispensable for securing accurate radiographs, as it entirely eliminates the element of distortion. But, nevertheless, you will hear often, conflicting statements, so that the physician unfamiliar with the work of the unknown ray, but witnessing the performance of splendidly handled apparatus, would be amazed to read the statements by well-known men, declaring

"x-ray a failure," or, "of not of much utility to the surgeon." Such cases would seem impossible with the evidence of his eyes; but they are creditable, if we apply them to the radiograph, made without the stamp of truth, without the evidence that a flurometer was employed.

There is no question about it that you may deceive the sense of touch, but not so easily the eye, supported by some measure which is absolutely unerring in its diagnosis. It is said, "that in a few cases of fracture the x-ray will give no information which we are unable to obtain by any other method, but in a large majority of the cases of fracture, we are able, as said, to determine, by physical examination, the exact condition of affairs just as readily as we are by means of the x-ray."*

Every expert and surgeon will be very much surprised at such a statement, knowing that fracture of the styloid, for instance, occurs in four out of five cases examined for Colle's fracture. This condition of affairs never could be made out by cruder methods (Thomas, Beck, etc). If there is a fissure fracture, even with close approximation, the x-ray will always show the fissure, but the exact condition might not be made out just as readily by physical examination.** With the help of the x-ray a local cranial wound may be much better examined than in the usual way. If fracture exists, whether it is simple, compound or complicated, with fissuration or depression, is determined in five to ten seconds, without any danger of complication.***

But the main thing. The x-ray will help us to make correct diagnosis and observe *through the dressing*, growths of the callus, or, *photograph through a plaster of Paris over case*, after an attempt at reduction, and see if proper approximation of the fragments had been accomplished, and find, perhaps, sometimes, that the union did not and could not take place.* This, under no circumstances, could be made out by other means of diagnosis. Or, if we have a case of suspected fracture and dislocation, or both, where the swelling will not allow any digital examination on account of the pain, or the inflammation which masks the true condition, the simple application of the x-ray at once reveals the status present, without any discomfort to the patient and great satisfaction to the surgeon.

"It has been the observation of every railroad surgeon, that it is quite impossible sometimes, to form a correct estimate of the amount of destruction suffered by the tissues,** and bone especially, in a railroad crush, when the patient is laboring under a great shock or pain. But with the help of the x-ray, we may see every particle of the crushed bone through the preliminary dressing, and determine if amputation is necessary.

And this is done without general anesthesia. How often is the operation really of secondary importance, as compared with the dangers of anesthesia in such cases.

The value of the x-ray in fractures, therefore, if we use the fluorometer, cannot be disputed any more. But, if we choose, we may try our sense of finger touch and determine the condition of affairs the old way and be protected and sure the new way. With reference to the presence of foreign bodies and their detection by the aid of the x-ray, they are readily seen and easily located without deviation, by using the fluorometer, but not otherwise.*

What we need is a *portable apparatus*,

*Harris: Western Medical Review, February 15, 1900 (discussion).

**Bernays: Same.

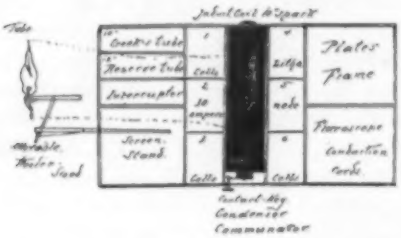
***New York Medical Journal, December 2, 1899. By the author.

*Western Medical Review, February 15, 1900. By the Author.

Lord: Journal A. M. A., March 17, 1900.

*Some Lessons from the Poetical Application of the Roentgen Rays to Surgery, Hall-Edwards, Birmingham, February 1900. "Practical X-Radiance," Scott, American X-Kay Journal, July 1899. Dennis, same, February 1900.

which will be most valuable for the surgeon. An induction coil which gives nominal 10" spark, could be specially designed with condenser and commutator and excited by lithanode, portable batter-



ies, with about six cells of 30 ampere hours and interrupter. Such apparatus, which could be portable (see plan), so that it can be carried from house to house, or used in country practice, as many patients cannot be taken to the office of the surgeon, would do so much good, especially if so constructed that the flurometer could be applied just as well.

Cedar Rapids, Ia.

STATIC MACHINE.

FRUITA, COLO., July 24, 1900.

DR. HEBER ROBARTS, EDITOR AMERICAN X-RAY JOURNAL.

Dear Sir:—In the March number of the JOURNAL you gave an account of my "improvised static x-ray machine."

I notice it has become quite customary to call a static electrical machine an x-ray machine. That seems quite natural, inas-much as the static machine has come into such general use since the advent of the Crooke's tube. I think, however, it would be better to call a static machine by its right name, as it is used oftener as a therapeutic agent than as an exciter of the x-rays.

I have received numerous inquiries as to how I improvised said machine. I would be glad to give a detailed account of how to construct an electrical machine, but the same would be rather tedious and of little value except to those possessed of considerable mechanical ability as well as perseverance.

Being an amateur mechanic myself and having a shop and tools of my own, I undertook the task of constructing a static machine of the Toepler style. The glass was carefully tested for its electrical qualities before being cut and drilled for the plates; the wood was carefully dried; hard fibre was tried for insulating instead of hard rubber, but was a failure. Careful drawings were made of all parts before constructing, and different combinations of the plates were tried, so as to get the best results.

I have made my 8-plate machine into a 16-plate, 8x27 in. revolving and 8x30 in. stationary. It runs very smoothly in ball bearings; it seems to do good x-ray work when run at 250 to 300 revolutions per minute, but has been tested at a much higher speed.

I find that a glass case has greatly improved the action of the machine, as well as being a necessity to exclude dust. The Leyden jars can be changed at will, there being four sizes.

There seems to be a constant inquiry as to how long sparks can be made on a particular machine, and I will say that I can usually get up an 11-inch spark, and a good deal of the time a 12-inch. Our climate is, however, particularly favorable to static electricity.

I know of nothing more scientific or useful for a physician to place in his office than a static electric machine. It is both ornamental and useful; by means of the spray or breeze, or whatever form we choose to use, we are enabled often to relieve our suffering patients immediately. We do not have to wait for special occasions to use the "static;" it can be used daily, and with the greatest comfort to the patient, whether a delicate female suffering from some reflex irritation, or a robust man suffering from an attack of lumbago.

One who possesses an efficient static machine, has an inexpensive and sure

method of using the x-rays. What can be more satisfactory than a fluoroscopic view of a fractured bone, even through the splints and bandages, or to see the diaphragm as it rises and falls with the respiratory movements.

In using a vacuum tube which is hard and causes leakage along the conductors and where joined to the tube, I have found no better means of stopping the leakage, than by inserting the conductors in rubber tubing, as is usually recommended, and then wrapping ends of vacuum tube and down on the rubber tubing for a few inches, with *rubber bandage*. If the conductor is flexible and inserted in rubber tubing, and then wrapped with rubber bandage, say 1½ inches by 3 feet, we have an ideal conductor and one easily changed, much more so than when friction tube is used.

Y. M. G. BEARD.

In Dr. Kolle's excellent article, entitled "Direct Method of Measuring X-Ray Intensities," published in the July issue of the AMERICAN X-RAY JOURNAL, we are sorry to have to correct typographical errors. Second column, third line, should read "a contact key" and fourth line should read, "to facilitate making."

In Miss Sharp's article, referred to in another place in this issue, we wish to emphasize two of her observations for the benefit of all x-ray workers. She says: "There are four details of the operation which require regulation, the distance of the tube from the skin, the length of the sitting, the strength of the current and the vacunm of the tube." Again she says: "How, for instance, are we to reconcile the different and exceedingly opposing actions of the x-rays which have come under my observation? There is the revitalizing action as shown in their effects on scar tissue; there is the antiphlogistic, as when the psoriasis spots fade away; there is the inflammatory, which may go on to necrosis; and there is yet another, which I shall go into more fully presently, viz., bactericidal. I must also mention, though I have had no experience of it, the analgesic action."

ANSWERS TO INQUIRIES.

J. W. K. We do not know of any journal devoted exclusively to static currents.

J. M. H. When the loop at either end of an x-ray tube is broken the connecting wires to the machine may be held in place by adhesive strips.

A. D. Fracture of a stationary plate does not materially alter the efficiency of the static machine provided the piece is retained in place.

C. L. C. The purple streamers that pour out from an electrode towards the patient is called "effluve."

F. B. C. Lupus vulgaris is cured by means of the x-rays. The writer has effected a cure of lupus vulgaris of the nose whose mother and grandmother had died of the same disease. The patient is perfectly well four months since the treatment. It required fifty treatments of twelve minutes each with a soft tube ten inches from the face. Inodular tissue that had formed from previous surgical treatment almost wholly disappeared.

M. B. In an article entitled "The X-Ray Treatment of Skin Diseases" by Margaret M. Sharp, M. D., read before the Roentgen Society and published in the Archives of the Roentgen Rays, you will find the technical use of the x-rays for the removal of hairs.

H. L. It is known that x light is generated from the cathode. In Rollins' long serial, "Roentgen Rays," he says, "in the process of preparing a good x-light tube, the gas is removed more rapidly from the

anode than from the cathode." But both terminals yield Roentgen rays. He further states that, "lines of swung ether units between the terminals, and free ether particles of electricity at each terminal; as we increase the energy applied to the tube, there comes a time when the dissociated ether collected about the gas particles in the terminals, tears them off and rushes them across the field, causing them to strike the opposite terminal with such force as to raise them to such a high temperature that they become centres from which x-light originates."

J. H. M. X-ray tubes do not increase their x-light output the "longer they are used." If this were so, then it would be better to let the machine run indefinitely till the x-rays penetrated iron walls. Modify the term. Tubes improve by use, but not regularly nor continuously. The best tube, however, must be "worked up" for best radiance.

B. B. The x-rays are used for other purposes than diagnosis, notably for the cure of lupus, sycosis, eczema, favus, wounds of the hairy parts of the body, acne, furunculosis, elephantiasis, epilation, scars, pus ulis, comedones and retinal impairment.

We desire to acknowledge the receipt of a number of radiographs received to-day from Miss Elizebeth Fleischman of San Francisco. The high grade work of this lady radiographer deserves public commendation for her painstaking and tireless energy to promote x-ray science. The excellence of her work has been mentioned through the lay press but especially commented upon by medical and scientific journals. Possibly the highest distinction one could receive in this country has been awarded her by the head of the medical department of our Government. One of the radiographs received from Miss Fleischman is of the ape family. In it are plainly seen the large intestines distinct from the small convolutions, the stomach is clearly seen, the liver, heart, and lungs readily outlined. The picture is twenty inches in length and the articulations are clear throughout. The radiograph of a fish, red snapper, is certainly the best we have thus far seen. Every detail of the harder structure of the fish that could be seen under dissection with the unaided eye is here shown.

An interesting specimen is that of a head showing non-erupted second molar above and below and the still more delayed wisdom teeth which are yet in the pulp. This entire specimen is unique, head and trunk, and we desire to know more about it. The lizzard and hands are all good.

If Miss Fleischman is a fair criterion of what other women may do in radiography it will be well for us that the infection should spread. Miss Fleischman has improved the art and made diagnosis more certain and she has succeded financially and socially. She is a member of the Roentgen Society of the United States.

Roentgen Rays for Examining Coal.—Along abstract of a communication of Prof. Courot to the Society of Mineral Industry in St. Etienne, France, on the use of Roentgen rays in the estimation of the impurities in coal. The method is based upon the fact that Roentgen rays traverse such hydrocarbons as wood and such an element as the diamond, while silicate of aluminum or silica are opaque to them, as previously noticed in the Digest. His apparatus is described at some length and several of his radiographs of various coals and products are reproduced. "As this method of analysis does not reveal the condition in which the carbon exists and as it is impossible to determine the percentage of sulphur while approximating the amount of ash, it would seem to have greater scientific than technical value."—*Eng. E. Min. Jour.*, March 17.

"ARCHIVES OF THE ROENTGEN RAY."

We intended to abstract from the many valuable articles which appeared in the Archives of the Roentgen Ray for May, but the fullness of the editorials therein we prefer to reprint.

"There is no startling advance, nor anything very novel, to chronicle in the x-ray world, yet the value of the processes of radiography is being more and more recognised, and the physician is coming into line with the surgeon in making use of them.

The articles in our last issue, which we translated from the *Journal d'Electricite Medicale*, on pleuritic effusions, and that read at the February meeting of the Roentgen Society by Dr. Walsham, illustrating cases of tubercular disease of the lungs and aneurisms of the aorta, printed in our present issue, show that for the future the screen and the radiograph must play an important part in the diagnosis of diseases of the chest.

It will be a great gain to medical science if the assertion made by the author of the latter paper, that it is possible to diagnose the existence of tubercle in the lungs by an x-ray photograph at an earlier stage than has hitherto been possible by percussion and auscultation, be borne out by further experience. The being able to do so may lead, in some cases, to an earlier treatment and consequent cure of the affection. It will also be useful for prognosis to be able, as the former paper shows is possible, to distinguish between pleuritic effusions originating in a chill, and those which are caused by the presence of tubercular foci in the lungs.

The present number contains a paper by Mr. J. H. Gardner, who has had valuable experience in Sir W. Crookes's laboratory, and whose contributions to the Roentgen Society are always of interest. The paper contains a series of investigations for determining the "relative values of the different known methods of producing Roentgen rays with different degrees of absorbability." The apparatus employed is described and illustrated with numerous figures; and the ingenious standard measure or scale for comparing different results and expressing them numerically is specially interesting. The photographic method was employed, instead of the "platinum-aluminum window" used by Professor Roentgen for his experiments described in the paper, of which a translation appeared in the Archives, vol. iii., p. 80 *et seq.*

On Plate XCI. is an excellent radiograph of an arm, from which the radius had been removed some time previously, showing commencing growth of new bone, taken by Mr. Shenton at Guy's Hospital. Also two curious cases of exostosis of the metatasal bones, by Dr. Rodman of East Sheen.

We hear from many sources that the x-rays have been extensively used at the war in South Africa. Many of the wounded soldiers who have been sent to their homes to convalesce, or to the great military hospitals for treatment, have been allowed to bring with them prints of the radiographs taken of their injuries, which they exhibit to all comers with much pleasure and pride.

Plate XCII., which depicts two views of the femur of an officer wounded at the battled of Magersfontein, shows well the power which a bullet has to shatter a long bone. The progress of the case exemplifies also the rapid way in which wounds inflicted by the Mauser bullet heal. This is to be attributed partly to the nature of the wound, partly to the use of antiseptics, but is declared by the special commissioner of the British Medical Journal to be mainly due to the salubrity of the climate, where open-air treatment is virtually carried on, and wounds consequently seldom take on a septic condition.

On this plate is a photograph of the bullet which was extracted from the gentlemen's leg; it is distorted in a remarkable manner.

On the same plate is also a photograph of a Mauser bullet of the natural size and shape. The bullet is of lead, with a coating of nickel, and weighs 226 grains, or nearly ½ an ounce; it has a diameter of 0.376, or a little over ¼ of an inch, and is 1.18 inch long. The muzzle velocity of the Mauser rifle is 2,388 feet per second, and at 40 feet from the muzzle the bullet will pierce 4½ feet of deal. Its extreme range is 2½ miles, and its trajectory is very flat.

The Scientific American says: Paradoxical as it may seem, the Mauser rifle is a merciful weapon, and stands only second to the Red Cross in alleviating the horrors of war. The wounds, apart from vital spots, are pricks as compared with those of the large-bore rifles, and the impossibility of fighting with success in the open has driven the soldier to cover, with this result, that, in spite of desperate bravery on both sides, the percentage of losses has been the smallest in the history of warfare."

This is, however, another reason for the favorable course which the wounds have followed in this war, and the Government and the R. A. M. C. deserve the credit for it. According to the Times, Sir William MacCormac is reported to have said that "the improvements in the medical arrangements for this war are so marked that it is quite impossible to make any comparisan with the conditions in previous compaigns. Nothing that prevision could suggest or money purchase was wanting anywhere."

He also said that the wounds inflicted by the Lee-Metford and the Mauser bullets were very similar in character, and that both were certainly less fatal than were the large projectiles in former wars. The chief characteristics of the wounds he had seen had been the very small entrance and exit; and the intervening soft parts had been damaged to the least possible extent. He had seen no evidence of explosive bullets.

Ninety-five per cent of the cases in the general base hospitals recovered and were discharged, a very large proportion being able to return to duty at the front.

"The Roentgen rays," says Sir William, "were used as a matter of course, and nearly all the hospitals are now equipped with the apparatus for this method of diagnosis. It was always used previous to making exploration for a bullet, and an officer was told off especially to take photographs by it. An additional apparatus, which not only determines the place of the bullet, but also shows its depth from the surface, was proving of great value. The Boers also had the x-ray apparatus, and he saw it working at the German hospital at Jacobsdal."

With reference to the question of localization, we publish an original communication from Professor Barrell, of University College, Bristol, on a new method, requiring neither plumb-lines nor threads, which well deserves the attention of our readers. We understand that it will be exhibited at a future meeting of the Roentgen Society.

A society called the "Roentgen Society of the United States" has been organized in America on the lines of the kindred Society of London. Dr. Heber Robarts, of St. Louis, Mo., has been elected President, and Dr. J. Rudis-Jicinsky, of Cedar Rapids, Ia., is Secretary. Upwards of 100 members have joined the Society, and the subscription is five dollars.

THE AMERICAN X-RAY JOURNAL, edited by Dr. Robarts, is "accepted as the official organ of the Society," and members receive the journal free. Its objects are the "advancement of the knowledge of practical x-ray work and allied arts and sciences." Its membership is open to members of the medical profession and to all those interested in x-ray work scientifically. Mr. Nikola Tesla has been named first honorary member.

We wish this young Society great success; and, from the energy which our

cousins over the water infuse into all they do, and from the excellent start made, we feel sure it will both deserve and obtain it.

Generalized Cathode Rays.

Sagnac.—A French Academy note in which he endeavors to bridge the gap between ionized air molecules and cathode rays by the following considerations. Let the gold leaf of an electroscope be charged positively, and let the electroscope be divided by a metallic net from a space traversed by Rontgen rays and placed under the influence of another electrostatic field. Then the discharge of the gold leaf which takes place in the absence of any external field, is accelerated or retarded accordingly as the external and internal fields are of the same or opposite directions. This acceleration or retardation is not due to the mere presence of the external field, since that field produces no effect unless the x-rays are traversing it. Hence it must be due to some action of the ionized molecules which penetrate into the interior of the electroscope through the meshes of the net. If they have sufficient velocity on passing the mesh, they will skip over from an external to an internal line of force, and thus increase decrease the internal flux which is slowly discharging the gold leaf. This is another case of bombardment by charged particles which, on gradually reducing the pressure of the air and thus increasing their velocity, might be made to pass by insensible gradations into cathod rays.—*Comptes Rendus. Feb. 5; Electrical World and Engineer.*

Becquerel Rays.

Becquerel.—A French Acadmey paper giving an account of experiments in which he studied the dispersion of Becquerel rays by the photographic method. A scientific definition of the position of each ray in the "magnetic spectrum" is obtained by taking the product of the field into its radius of curvature. The product is constant for each ray, and varies from 360 to 2600 c. g. s. units.—*Comptes Rendus*, Feb. 12; abstracted in Lond. *Elec.*, March 2.

The Rontgen Society, London.

In his presidental address to the Rontgen Society, Mr. Wilson Noble pointed out that the greatest recent advance in Rontgen ray work was the practical realisation of stereoscopic radioscopy, the allusion, no doubt, being to Mr. Mackenzie Davidson's highly successful instrument, exhibited at the last conversazione of the Royal Society and already noticed in our columns. Mr. Noble said there were many things difficult to see, or, at any events, to distinguish with certainty when seen as a flat surface, but which came out with wonderful clearness when seen on a flat surface. One had only to look at an ordinary stereoscopic slide, first without and then with the stereoscope, to appreciate this. The same holds with the Rontgen ray stereoscope; more particularly was this the case with objects showing but little contrast and ill defined, such, for instance, as the early patches of tuberculosis in the lung. He could not but think that diagnosis of this disease would be enormously facilitated when visual stereoscopic radiography become general. Mr. Noble said that one noticeable feature of the present practice was the adoption of the influence machine by many workers. It should not, however, be forgotten that though the influence machine is excellent for screen work, it involves too long exposures to hope, its present inefficient state, to compete with the induction coil in photography. Mr. Noble said that the Rontgen rays had done admirable service on the battlefield and in the hospitals in South Africa, notwithstanding the great practical difficulties that had to be overcome in keeping tubes efficient, in conveying and charging accumulators, &c. Minor advances had been made during the past year in the way of shortening exposures and improving definition.—*Electric Review London.*

Inorganic Iron.

Henry in a recent Medical Essay after referring to the hypoplasia of the blood forming organs noted in chlorosis by numerous observers states that the essence of the affection lies in a reduced amount of hemoglobin and consequently feeble oxygen carrying power in the red blood cells, and that this deficiency is due to inherent biochemic peculiarities in the cell itself which make absorption difficult. Referring to the use of iron, he states that on account of its marked hemoglobin-genetic power inorganic iron is the form in which the remedy should be administered. In three chlorides, (liq. ferrisenic) a serious disadvantage of iron preparations—constipation—is completely obviated by combination with the glandular stimulants bi-chloride of mercury and arsenic in small assimilable doses. Give in milk or water.

An American Remedy in Ireland.

The Antikamnia Chemical Company have forwarded to us from their London House, No. 46 Holborn Viaduct, samples of their five-grain antikamnia tablets, and also of antikamnia and codeine tablets. The former are so well known that it seems hardly necessary to do more than refer to them as an unequaled analgesic. The antikamnia and codeine tablets contain four and three-fourths grains of antikamnia and a quarter of a grain of codeine. This is a valuable combination, the synergetic effects being all that could be desired.—Extract from *Dublin Medical Journal*, March 1900.

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